

## REMARKS

Claims 1, 3, 13, 14, 18, 29, 36, 38, 42, and 45 have been amended and claims 2, 17, 32, 37, and 44 have been cancelled. Accordingly, claims 1, 3-6, 8-16, 18, 19, 21-31, 33-36, 38-43, 45-47, and 49 are pending in the present application. The claim amendments and new claims are supported by the specification and claims as originally filed, with no new matter being added. In particular, support for the amendments and new claims can be found in the originally filed claims 17, 26, 32, 27, and 44 and in the specification as filed at page 11, lines 2-13. Accordingly, favorable reconsideration of the pending claims is respectfully requested.

### 1. Rejections Under 35 U.S.C. § 112

Claims 1-13 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which application regard as the invention. In particular, the Examiner has indicated that the scope of the preambles of claims 1 and 13 do not match the body of the claims.

In response, claims 1 and 13 have been amended to so that claim bodies better match the preambles. Claim 1 now recites “etching the silicon dioxide dielectric layer” and claim 13 recites “etching into the silicon dioxide dielectric layer to form a self aligned contact hole.” Applicants therefore respectfully request that the rejection of claims 1 and 13 under 35 U.S.C. § 112 be withdrawn.

### 2. Rejections Under 35 U.S.C. § 102(e)

Claims 1, 2, 4, 6, 9, 14-16, 19, 22, 29, 31-33, 35, 42-43, and 46 have been rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent No. 6,399,511 to Tang et al. (“*Tang*”) for the

reasons set forth on pages 2-3 of the Office Action. Applicants respectfully traverse.

Each of the independent claims 1, 14, 29, and 42 has been amended to now recite that the etch stop layer comprises a refractory metal nitride. In particular, the amendments to claims 14 and 42 have been made to incorporate the limitations of claims 17 and 44, which the Examiner has indicated would be allowable if rewritten in independent form including all the limitations of the base claims and any intervening claims. The amendments to claims 1 and 29 have been made similarly to make those claims also patentable over *Tang* by reciting the etch stop layer or underlying layer comprising a refractory metal nitride.

Accordingly, Applicants respectfully assert that claims 1, 14, 29 and 42 contain limitations that are not disclosed, taught, or suggested by *Tang* and are therefore patentable over *Tang*. Claims 2, 4, 6, 9, 15, 16, 19, 22, 31-33, 35, 43, and 46 depend from one of claims 1, 14, 29 and 42, include the limitations therein, and are therefore patentable over *Tang* for at least the reasons presented hereinabove with respect to claims 1, 14, 29 and 42.

3. Rejections Under 35 U.S.C. § 103

Claims 8, 10, 13, 21, 23-28, 30, 34, 36, 39-41, 47, and 49 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Tang* for the reasons set forth on pages 4-5 of the Office Action. Applicants respectfully traverse.

Claims 13 and 36 have each has been amended to recite that the etch stop comprises a refractory metal nitride. Therefore, for the same reasons that the previously discussed independent claims are patentable over *Tang*, claims 13 and 36 are patentable over *Tang*. In addition, claims 8, 10, 21, 23-28, 30, 34, 39-41, 47, and 49 depend from one of claims 1, 14, 29, 36, and 42, include the limitations therein, and are therefore also patentable over *Tang* for at least the reasons presented

hereinabove with respect to claims 1, 14, 29 and 42.

Claims 1-6 and 9-13 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,403,488 to *Yang et al.* for the reasons set forth on pages 6-8 of the Office Action. Applicants respectfully traverse.

Present claim 1 has been amended to recite: “providing a gaseous etchant including a hydrofluorocarbon etch gas and including an etch selectivity enhancing fluorocarbon compound selected from the group consisting of CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>4</sub>F<sub>8</sub>, C<sub>5</sub>F<sub>6</sub>, C<sub>5</sub>F<sub>8</sub>, and combinations thereof.” Present claim 13 also contains a similar limitation. These compounds can be contrasted with the limited “strained cyclic (hydro)carbon[s]” disclosed by *Yang*. Although the compounds disclosed by *Yang* may have the same number type and number of elements, they are limited to “strained cyclic” compounds, a narrower and very specific class of compounds that does not teach or suggest the presently claimed methods that use the presently recited fluorocarbons.

Accordingly, Applicants respectfully assert that the limitations of present claims 1 and 13 are neither taught nor suggested by *Yang*. In addition, claims 2-5 and 9-12 depend from claims 1, include the limitations therein, and are therefore patentable over *Yang* for at least the reasons presented hereinabove with respect to claim 1.

In addition, present claim 3 has been amended to recite, *inter alia*, “wherein: the hydrofluorocarbon etch gas is provided at from about 30 sccm to about 50 sccm and the etch selectivity enhancing fluorocarbon compound is provided at from about 0 sccm to about 25 sccm; and the silicon dioxide dielectric layer is exposed to the gaseous etchant at a pressure of from about 10 mTorr to about 40 mTorr.” Support for these limitations can be found in the specification as filed at page 11, lines 2-13. Thus, according to the presently claimed invention the combination of a hydrofluorocarbon etch gas and an etch selectivity enhancing fluorocarbon compound can be used at

the relatively low pressures of from about 10 mTorr to about 40 mTorr at the cited concentration ranges.

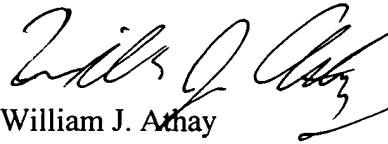
In contrast, *Yang* requires higher pressures over similar concentrations of its respective gasses. Namely, “[T]he pressure may be 50-1000 mTorr.” “When CHF<sub>3</sub> is used as the etching gas, a flow rate of . . . more preferably 15-50 sccm.” “When c-C<sub>4</sub>F<sub>8</sub> is used as the strained cyclic (hydro)fluorocarbon gas, the flow rate may be . . . more preferably 0-50 sccm.” *Yang* at column 5, lines 37-56 (For the purposes of this comparison, the Applicants accept, *arguendo*, the comparison the Examiner has made between the claimed etch selectivity enhancing fluorocarbon compound and the strained cyclic (hydro)fluorocarbon gas.) Accordingly, Applicants respectfully submit that the limitations of present claim 3 are not taught or suggested by *Yang*.

CONCLUSION

In view of the foregoing, Applicants respectfully request favorable reconsideration and allowance of the present claims. In the event the Examiner finds any remaining impediment to the prompt allowance of this application which could be clarified by a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney.

Dated this 13<sup>th</sup> day of June 2003.

Respectfully submitted,



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